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These very brief and incomplete suggestions are given with the hope that some sister nurse struggling with the problem that has confronted so many of us may have her way made easier by hearing of the experiences of another.

MILK AS FOOD

EXTRACTS FROM FARMERS' BULLETIN 74

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A QUART of milk contains about the same amount of nutriment as three-quarters of a pound of beef, namely, about four ounces.

Milk contains all of the ingredients needed for nourishment; that is, it furnishes the materials which build up the body and keep it in repair, and also those which supply it with fuel to keep it warm and to furnish the animal machine with the power needed to do its work.

When milk is used for food the casein and allied compounds serve the body for building and repair, and are also used for fuel. The fat and sugar are the chief fuel ingredients. The mineral compounds aid in forming tissue, and have other uses as well, but they are needed only in small quantities.

The value of milk for nourishment is not as well understood as it should be. Many people think of it as a beverage, rather than a food.

The chief bulk of milk is made up of water, varying from ninety per cent. in a very poor product to eighty-four per cent. in an unusually rich milk.

The principal nitrogenous compound of milk is casein. Casein contains both phosphorus and sulphur. Besides the casein there is a certain amount of albumin present, called lact-albumin, or albumin of milk. This is more or less similar to the albumin which occurs in blood and in white of egg.

There are other nitrogenous substances occurring in milk, but in insignificant quantities.

The fat of milk is the source of butter and enters largely into the composition of cheese.

Milk sugar is similar in chemical composition to cane sugar, but is not nearly as sweet.

Human milk is richer in sugar and poorer in protein than cow's milk, but the fuel value is about the same.

CHARACTERISTICS AND PROPERTIES OF MILK.

The color and opaqueness of milk are due mainly to globules of fat, which are very minute and almost numberless. These are held in suspension in the liquid in the form of an emulsion; but since they are lighter than water, after the milk has stood for some time they gradually rise to the surface and thus accumulating form the cream.

When milk has stood for some time the milk sugar undergoes decomposition, whereby lactic acid is formed and the milk becomes sour. Accompanying this souring of milk there is a change in its consistency, and it becomes thick, or curdled. The same change can be brought about by the addition of an acid—vinegar, for example. If milk thus curdled be neutralized with some alkali, such a lime water or soda, the curd is redissolved.

A scum forms on the surface of milk when it is boiled. This is probably due to the coagulation by heat of the protein of the milk, chiefly its albumin.

VARIATIONS IN MILK.

The variation in composition of pure milk is due in a large degree to the breed or individuality of the cow, to the methods of feeding and handling, and the length of time since calving.

In general young cows produce richer milk than old ones, though much depends upon the health and vigor of the animal. . . . . Another cause of variation in milk is found in the temptation of unprincipled milkmen to adulterate their product. The chief methods of adulteration are (1) the addition of water, (2) the removal of a portion of the fat, and (3) the addition of preservatives. The two former methods result in a greater or less diminution of the food value, depending upon the extent of adulteration. The latter method does not detract from the total nutrients in the milk, but it adds substances which, while not active poisons, may, when taken in the milk regularly in small amounts, produce deleterious results.

THE PROCESS OF DIGESTION OF MILK.

When milk is taken into the stomach, it is speedily curdled by the action of the pepsin and acid of the gastric juice. When milk is eaten alone or in large quantities, the casein gathers in large lumps, which may be difficult of digestion by some. This is particularly the case with infants and with adults whose digestion is weak, and is one of the reasons why milk should be used with other foods and not taken in large quantities alone.

Human milk differs from cow's milk in the way in which it curdles when taken into the stomach. The casein of the former is not precipitated in such large lumps, but is more flocculent, and is thus more easily digested and does not cause irritation.

EFFECTS OF COOKING.

The more common experience seems to indicate that cooking or heating the milk makes the proteids somewhat more difficult for most persons to digest, but there are persons who cannot take fresh milk with comfort, with whom boiled milk agrees very well.

SKIM-MILK.

Even after average milk is skimmed it still contains nearly ten per cent. of solids or nutritive ingredients. . . . The value of skim-milk as food is not generally appreciated. Taken by itself, one has to drink a large quantity to get the needed nourishment, and, further, it is so readily disposed of that it does not satisfy the sense of hunger. But when taken with bread or used in cooking, it forms a very nutritious addition to the food. . . .

Two quarts of skim-milk have a greater nutritive value than a quart of oysters.

BUTTERMILK.

Buttermilk used as a beverage furnishes more nutriment than almost any other beverage except whole milk and skim-milk, unless it be cocoa or chocolate.

An ordinary glass of buttermilk would contain as much nourishment as half a pint of oysters, or two ounces of bread, or a good-sized potato.

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